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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/591,858

09/06/2006

Tomonari Taguchi

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EXAMINER

CHIBOGU, CHIEDU A

ART UNIT

PAPER NUMBER

3618

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/591,858	Applicant(s) TAGUCHI, TOMONARI	
	Examiner CHIEDU A. CHIBOGU	Art Unit 3618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 December 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>06/06/2007 and 09/06/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The amendment to the claims as filed on 09/06/2006, has been entered. Claim 2 has been cancelled. Claim 8 has been entered.

The amendment to the drawings as filed on 12/29/2006, has been entered.

The amendment to the specification as filed on 12/29/2006, has been entered.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1 and 3, are rejected under 35 U.S.C. 102(b) as being anticipated by Carabetian (FR 2512499 A1_ *translated*).**

3. **Regarding claim 1, Carabetian teaches an exhaust heat recovery power generation device (Fig. 3), comprising:**

- an exhaust pipe (fig. 3, as defined by elements 11, 22, and 23) receiving exhaust gas from a heat source (page 3, L1-L3; in view of page 6, L27 - page 7, L4) and passing the exhaust gas in a prescribed direction (page 5, L22 - page 6, L3);
- a cooling pipe (fig. 3, element 13) arranged along the exhaust pipe to pass a refrigerant for cooling the exhaust pipe (fig. 2);
- a refrigerant supply unit (fig. 2, element 14) supplying the cooling pipe with the refrigerant;

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- a plurality of thermoelectric power generation stacks (page 10, L1 – L2; in view of page 11, L4-L7) attached to the exhaust pipe and the cooling pipe sequentially in a direction in which the exhaust gas flows (figs. 1-3; in view of page 5, L22 - page 6, L3);
- the plurality of thermoelectric power generation stacks each include a plurality of thermoelectric power generation elements (fig. 3, element 17) formed sequentially in the direction in which the exhaust gas flows (fig. 3; in view of page 5, L22 - page 6, L3);
- the plurality of thermoelectric power generation elements each generate power corresponding to a difference in temperature between a high-temperature end and a low-temperature end of the thermoelectric power generation elements (page 5, L22 - page 6, L7), the high-temperature end and the low-temperature end being attached to the exhaust pipe and the cooling pipe, respectively, at a corresponding site (fig. 1; in view of fig. 3; in view of page 5, L13 – L21); and
- the refrigerant supply unit is configured to supply the refrigerant in such a direction that the exhaust pipe and the cooling pipe pass the exhaust gas and the refrigerant, respectively, in opposite directions (figs. 1-3; in view of page 5, L22 – page 6, L3).

4. **Regarding claim 3, Carabetian teaches:**

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- each of the thermoelectric power generation elements being arranged to be sandwiched between the exhaust pipe and the cooling pipe (figs. 1-3; in view of fig. 5; in view of page 9, L4-L6).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 4-8, are rejected under 35 U.S.C. 103(a) as being unpatentable over Carabetian; in view of Hoshiya et al. (USP 6383114 B1).**

7. **Regarding claim 4, Carabetian teaches an automobile (page 3, L1-L3; in view of page 4, L14-L16), comprising:**

- a first driving force generation device using a fuel's combustion energy as a source to generate wheel driving force (page 3, L4-L6; in view of page 5, L22 – page 6, L7);
- the exhaust heat recovery power generation device as recited in claim 1, above;
- the exhaust heat recovery power generation device generating power with the first driving force generation device serving as the heat source (page 3, L4-L6; in view of page 5, L22 - page 6, L7); and
- a source of electric power (page 3, L3).

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Carabetian fails to teach:

- the second driving force generation device.

Hoshiya et al. discloses an automobile (fig. 3), comprising:

- a second driving force generation device (fig. 3, element 16).

It is noted that Carabetian teaches using the power generated by the exhaust heat recovery power generation device for charging or operating and/or powering components of the automobile (page 7, L12-L15).

It is also noted that Carabetian's invention is aimed at making the automobile more energy efficient by generating useful energy from the energy wasted from the operation of the automobile's first driving force generation device (page 3, L1-L9).

It is also noted that Hoshiya et al.'s invention is generating useful energy from the automobile's wasted energy via the automobile's regenerative braking (col. 9, L20-L26).

It would have been obvious for one having ordinary skill in the art to modify Carabetian, with Hoshiya et al., to use the power generated by the exhaust heat recovery power generation device and that supplied from the source of electric power as a source to generate wheel driving force as a means for increasing the automobile's efficiency by reduction of the automobile's functional dependency on the first driving force generation device of the automobile.

8. Regarding claim 5, Carabetian as modified, teaches:

- the source of electric power is a secondary battery (Carabetian page 3, L3); and

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- the exhaust heat recovery power generation device includes a power converter (fig. 3, element 26) converting the power generated by the exhaust heat recovery power generation device to voltage charging the secondary battery (page 7, L12-L15).

9. **Regarding claim 6, Carabetian as modified, teaches:**

- a driving power conversion device (Carabetian fig. 3, element 114) converting received power to power driving the second driving force generation device (Carabetian page 7, L12-L15; in view of Hoshiya et al. col. 8, L65 - col. 9, L6); and
- the power converter converting the power generated by the exhaust heat recovery power generation device to power input to the driving power conversion device (Carabetian page 7, L12-L15; in view of Hoshiya et al. fig. 3, element 114; in view of Hoshiya et al. col. 8, L65 – col. 9, L6).

10. **Regarding claim 7, Carabetian as modified, teaches:**

- a power generation device (Hoshiya et al. fig. 3, element 16; in view of col. 9, L20-L24) converting at least a portion of the wheel driving force generated by the first driving force generation device to power usable as power driving the second driving force generation device (Hoshiya et al. col. 9, L44-L52);

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- a control device (Hoshiya et al. fig. 3, element 104) operative to drive the automobile in accordance with a driver's instructions (Hoshiya et al. col. 7, L64 - col. 8, L15);
- the source of electric power is a secondary battery (Carabetian page 3, L3); and
- the control device considers vehicle requirement power Calculated in accordance with the driver's instructions and required to run the vehicle and charge requirement power for maintaining a level of charge of the secondary battery and in addition thereto power generated by the exhaust heat recovery power generation device to control the first driving force generation device's operation (Hoshiya et al. fig. 3, element 106; in view of col. 11, L5-L24).

11. **Carabetian as modified, teaches all the features of the claimed invention of claim 8 (see claim 3, above; in view of claim 4, above)**

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Refer to the ***NOTICE OF REFERENCES CITED*** for prior arts considered pertinent, but no relied on at this time.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHIEDU A. CHIBOGU whose telephone number is (571)270-7019. The examiner can normally be reached on Monday - Thursday (07.30am - 5.00pm).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Ellis can be reached on (571)272-6914. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CHIEDU A. CHIBOGU/
Examiner, Art Unit 3618

/Christopher P Ellis/
Supervisory Patent Examiner, Art Unit 3618